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FOREST LAND MANAGEMENT IN THE CONTEXT OF NATIONAL LAND USE

by

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FOREST LAND MANAGEMENT IN THE CONTEXT OF NATIONAL LAND-USE[1/]

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INTRODUCTION

1. Land has become an increasingly scarce resource. While land area is more or less fixed, the need for land to provide the basic needs of an ever-increasing population continues to mount. Moreover, due to improper land-uses and land mismanagement, more areas particularly in the uplands have become degraded and now pose a serious threat to the viability/sustainability of the ecosystem. Most of these degraded areas are or should be forest lands and they constitute a major component of the national land-use system, hence, our topic in this session certainly deserves our and our leaders' attention.

2. My biggest problem in writing this paper has to do with arrangement. More specifically, I had some problem deciding which should be presented first, multiple-use forest management or the framework of a comprehensive land assessment/allocation system. These two concepts are interrelated and depending upon the emphasis, one subsumes the other.

3. Anyway, I finally decided that this paper should contain five major topics presented in the following order: basic concepts

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related to land-use and forest land management, framework of a comprehensive land-assessment and allocation system, operationalizing multiple-use forest management, a possible forest land-use scenario, and its implications on the people's forests program.

BASIC CONCEPTS

The Philippine Forest Ecosystem

4. The Philippine forest areas are characterized by two general conditions: abundant rainfall/solar energy and high temperatures. As a result, there is acceleration of weathering and erosion, hence, the soils are of low nutrient and absorptive capacity. The soils are also prone to nutrient losses due to leaching. Moreover, the wind systems in the region bring destructive cyclones. Because of these factors (high temperatures, poor soils and destructive typhoons), net productivity in the tropical rainforest areas like those in the Philippines is lower than expected. On top of the biophysical characteristics of these areas, poor people, indigenous as well as migrant populations, depend upon the forests/forest areas for their livelihood.

5. The above conditions imply certain general guidelines for forest land management in the Philippines. These include: a) maintenance of forest cover for effective soil, water and nutrient conservation; a higher percentage of the nutrients in a tropical forest ecosystem is in the vegetation not in the soil, b) adoption of a land management system for balanced nutrient cycling, c) maintenance of biotic diversity of life forms (flora and fauna), species composition and age classes in order to minimize the incidence of pest/disease outbreaks, and d) implementation of land management systems which

accommodate the forest occupants as integral component of the forest ecosystem: land management strategies which harness them as active participants in forest development and conservation.

Sustained Multiple-Use Forest Land Management

6. Forests are renewable resources although their renewal is quite sensitive to certain human activities like destructive logging, burning and/or cultivation. Forest land uses must be sustainable, so must the other land uses. And, forests provide three types of services: production of wood, fiber, water, food and other forest products; protection for other natural resources, communities and their life-support systems against wind, fire, siltation, floods, droughts, dunes and other destructive agents; and provision of certain amenities like recreation, aethetics, an invigorating/pleasant environment and other "intangibles" for man's inner pleasures/relaxation. For these reasons, the basic principles of sustained yield and multiple-use forest management have become worldwide forestry policies.

7. Sustained yield forest management in its simplest interpretation means "continuity of production"; it also implies "increasing periodic production" over time. On the other hand, multiple use refers to multiple products/services from a given forest management unit, thus, multiple use forest management can contribute to optimal land utilization. In the face of increasing scarcity of land resources, therefore, the concepts of sustained yield and multiple use may be integrated into one comprehensive principle of forest land management for sustainable uses. Obviously, the capacity of the forest to provide a desired/optimal mix of products and services on a continuing basis is a most desirable condition in forest land management.

Land Assessment and Allocation

8. The composite land allocation process involves three sequential steps: land (capability) classification, land-use suitability assessment, and allocation of the land resource into various uses based on a desired set of objectives and land management strategies.

9. Land capability is the inherent capacity of land to perform under a given use, thus, land capability classification is the description of a landscape unit in terms of its inherent capacity to sustain a desirable combination of plants and animals. It is the first approximation in the process of subdividing a land-use planning unit (watershed, island, forest working circle, ...) into land-use response units and is restricted to the consideration of biophysical factors, e.g., climate, vegetation, fauna, geology, soils, topography and elevation.

10. A landscape or land-use response unit is a mappable area, roughly homogeneous as to soil, topography, climate and biological potential whose boundaries are determined by the rapid change in one or more of its characteristics. A landscape unit is characterized as an ecosystem, i.e., the physical structure and relationships of soil, water, nutrients, energy, plants and animals. The delineation of a geographical area as a landscape unit requires differentiation from adjacent units and recognition of similarity to the same type occurring elsewhere.

11. Land suitability refers to the fitness of a given area for a specific land-use, hence, land-use suitability assessment is the rating of the response of a landscape unit to alternative uses. The basic constraint underlying land-use suitability assessment is "sustainable use" based on given land management strategies, and the factors considered include: current viable technologies for alternative uses,

land-use related hazards and non-deterioration of the landscape unit's capability.

12. Land allocation is the determination of the desired mix of land uses and specification of the land-use for each given landscape unit based on productivity under alternative sustainable uses, demand for crops and services, current land-use, location, accessibility, socio-cultural background of people on the land, their attitudes/ reactions to changes caused by alternative land-uses, and national/ regional/local development priorities, goals and policies.

13. From the above concepts, the purposes of land classification, assessment and allocation may be enumerated as follows: a) to provide a sound basis for identifying sustainable land management strategies, b) to preserve and maintain/improve the productivity of the land resource, c) to avoid the disastrous effects of improper, reaction-type or unplanned land allocation, and d) to help provide pressing and varying needs of people within the land-use planning unit's area of influence.

FRAMEWORK OF A COMPREHENSIVE LAND ALLOCATION SYSTEM

Brief History of Land Classification

14. Formal land classification work in the Philippines started in 1919. The purpose has been to dichotomize the country's land resources into forest lands and alienable and disposable (A and D) lands with an initial national goal of 42.00% as forest lands (Sajor 1955). This was reduced to 40.63% in 1975 (BFD 1975). The whole land classification process has been done by field work with preliminary assessment on aerial photographs, topographic maps, and vegetative maps whenever these are available. The field work entails: evaluation

of slope, vegetation and other features of the land; actual survey; and establishment of boundaries.

15. The classification of the country's land resources into forest and A and D lands has been based primarily on slope and to some extent on vegetation. Up to 1975, the responsibility of classifying lands of the public domain had rested solely on the Bureau of Forest Development. Since then, technical men from the Bureau of Lands, Bureau of Fisheries and Aquatic Resources (in the case of mangroves and other potential fishery areas), and the Bureau of Mines and Geo-Sciences (where applicable) have been added to form the land classification composite teams. Also, as embodied in the new Constitution, lands of the public domain are now classified into seven categories namely: agricultural, industrial/commercial, residential, resettlement, mineral, timber/forest, and grazing lands.

16. The land classification work has been a very slow process. This has resulted in the pre-emption of land-use in favor of A and D or non-forest classification. In many cases, when the land classification team gets to an area, an upland farm has already taken the place of the forest. Thus, productive forest lands have been indiscriminately destroyed and unsuccessfully converted into sustainable crop production areas. This triggers a vicious land degradation cycle. The situation has reached the dangerous point where slopes and steep areas are subjected to non-sustainable cropping systems and vast areas have been rendered unproductive and destructive. Current estimates indicate that some 8 million hectares of forest lands and 3 million hectares of A and D lands or about 36 percent of the country's land resources now need rehabilitation.

Trends in the Country's Land-Use Structure

17. Table 1 presents the official statistics on land-use/vegetative cover and the status of land classification during the period 1948 to 1982. As of 1982, 13.4 and 11.0 million hectares had been classified as A and D lands and Timberland, respectively; 5.6 million hectares still remained to be classified. At the rate land classification was going over the last 10 years, it would take another 21 years to complete the job.

18. The available statistics on national land-use and vegetative cover for the same 35-year period (1948-1982) are obviously not as clear-cut as the land classification statistics. In fact, these statistics are more abstract than real since they are not mappable. The forest land-use/vegetative cover estimates are extrapolations based on the nationwide forest inventory in the early 1960's using rates of changes which were determined for the 1950's up to the time that inventory was conducted.

19. Looking at the 1982 forest area statistics another way, the BFD Annual Report provides the following estimates: 11.1 out of 16.6 million hectares of forest lands are still covered with timber, 9.4 million of which are productive forests; of these, 2.7 and 3.8 million hectares are old-growth and second-growth stands, respectively.

20. An attempt was made to come up with a mappable forest area and timber inventory statistics with the nation-wide large-scale aerial forest photography from 1965 to 1972. The results of this work were used in the 1973 Forestry Statistics when the project was completed. Of course, the estimates were applicable for the mid-year of the period of photography, say 1969, not 1973 as reported. The forest area estimates for 1969 based on this 87% forest photo-

Table 1. Land-use/Vegetative Cover and Land Classification Statistics (in million hectares).

	1948	1953	1958	1963	1968	1973	1978	1982
Alienable/ Disposable Lands	8.6	10.1	11.6	12.3	12.4	12.8	13.1	13.4
Unclassified Public Lands (Forests)	18.3	15.9	13.2	10.0	9.5	8.3	7.5	5.6
Timberland	3.1	4.0	5.2	7.7	8.1	8.9	9.4	11.0
Total	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Commercial Forests	13.2	11.4	9.3	9.4	9.4	11.9*	11.3*	10.5*
Non-commercial Forests	4.4	4.5	3.9	5.2	7.1	1.8*	1.8*	1.8*
Cultivated Lands/ Plantation Croplands/ Urban Areas	6.4	8.2	10.4	11.6	10.0	13.6	14.8	15.9
Grasslands/ Open Lands	5.2	5.1	5.5	3.1	3.1	2.4	2.0	1.7
Marshes/Swamps	0.6	0.6	0.7	0.5	0.2	0.1	0.1	0.1
Total	29.8	29.8	29.8	29.8	29.8	29.8	30.0	30.0

Sources: BFD Statistics and Reports

*Classification was changed from commercial and non-commercial to productive and unproductive forests.

coverage, after adjusting for the unphotographed portions, are as follows (in million hectares): old-growth -- 4.49, second-growth -- 3.46, unproductive/mossy -- 1.75, pines -- 0.28, mangrove -- 0.08, reproduction/brush -- 2.78, and grass/open lands -- 4.32, or about 10.1 million hectares of forested forest lands in 1969. Note that the BFD report for 1982 gives the remaining forested forest lands to be 11.1 million hectares.

21. Other estimates of forested areas were made using small-scale photos/images. Dr. Romeo Bruce of the U.P. College of Engineering, Institute of Photogrammetry and Applied Geodesy, studied 1974 LANDSAT photos and estimated the forested areas as 8.9 million hectares. Adjusting this for the forested A and D areas gives us an estimate of about 8.3 million hectares of forested forest lands in 1974. Bonita and Revilla made a similar study of 1976 LANDSAT photos and got 9.0 million hectares of forested forest lands. The Natural Resources Management Center of the MNR used a computer-assisted methodology to analyze 1972-73 LANDSAT digital data and came up with an 11.4 million-hectare estimate of forested areas including 3.8 million hectares of partial-closure forests which when adjusted for the forested A and D lands provides an estimate of 10.8 million hectares of forested forest lands. These three estimates are not really that far apart. The discrepancies are attributed to the minimum criterion (subjective) used for an area to be judged forested. For example, in the case of the NRMC estimate, if 50% of the partial-closure forests are judged as non-forested, then the estimate would approach the two other estimates. More convincingly, if the 1969 total forested forest lands of 10.1 million hectares which is probably the most reliable of all existing estimates were adjusted for forest land losses, it is not

hard to believe that we had only about 8.5 to 9.0 million hectares of forested forest lands in 1976, or only about 7.8 to 8.3 million hectares in 1983.

22. On the basis of the 1969 estimates, the remaining old-growth forests may now be only 2.0 to 2.5 million hectares. Assuming that only 60% of these areas are economically accessible, we would now be left with only 1.2 to 1.5 million hectares of commercial old-growth forests. These could provide our industrial wood requirements for 12 to 15 years more or up to 1995 or possibly to the year 2,000.

The Need to Assess/Allocate Lands

23. Land is a basic natural resource; it is also a fragile resource especially in the uplands. Being an input to most production activities, it has many alternative and competing uses. It has also become increasingly scarce, thus, more than ever, it has become necessary to do a good job of allocating it into its alternative uses: human settlement, industrial site, food production, forest production, mineral production, energy production, biotic conservation, environmental conservation/protection, or any combination of the above.

24. Various symptoms of environmental overstress and the worsening degradation of the uplands indicate errors or imbalances in land-use and land mismanagement. Considering that land allocation will remain a politico-management decision, the need for land suitability assessment to help the decision-maker choose the use(s) of a land unit from a set of viable/sustainable land-use alternatives has become mandatory. The land-use suitability or non-suitability ratings for each landscape unit which are based on verifiable facts need to be documented.

Proposed Land Assessment/Allocation System

25. Land assessment and allocation can be viewed as a matrix of hierarchical processes. In one dimension, there is the hierarchy of the national, regional, district and land management unit levels. In the other dimension, there is the hierarchy of the economic sectors/activity areas and their component land-using activities. Land assessment and allocation in both dimensions may then involve the following steps. First, the country's land resources are classified based on biophysical features, assessed for alternative suitable uses, and allocated into broad uses based on national needs and priorities, both socio-economic and environmental. Second, regional land resources are classified and allocated into more specific uses based on the region's needs, priorities and comparative advantages as well as weaknesses relative to the other regions. Third, the land resources of districts and finally the land management units (LMU) such as watershed systems or river basins, sustained yield timber production units, or multiple use forest management units are classified and allocated based on more specific objectives, production possibilities, and a set of technical, socio-economic, and ecological criteria and constraints. Finally, the results of allocation at the different levels and various activity areas and their components must check out. If not, the allocation process would go through another iteration. Specific sets of land assessment criteria, guidelines, and procedures are used at the various levels. At all levels, the classification, assessment and allocation are monitored and laid out on maps of appropriate scale. The land assessment and allocation system described herein is illustrated in Figure 1.

26. The solution of the allocation part of the land assessment and allocation system may be specified by quantitative models such as linear programming or one of its variants, likely goal programming. The relative scarcity of land resources to meet growing needs, the variety of output units of the different land-using activities, and the desirability of information on trade-offs among alternative uses suit goal programming as an approach to the numerical solution of the land allocation problem. Our experience with goal programming as a quantitative tool for land allocation has indicated its usefulness for providing information which are needed to make the best decisions in land-use allocation. An alternative approach which is simpler is to develop an iterative allocation system which maximizes benefits (or optimizes a set of desired objectives) from the land-use planning unit.

27. It should be clear from the foregoing discussion that the land assessment and allocation system requires the formulation of comprehensive development plans for all the country's forest and related land resources. Relative to this need, the Forestry Development Center, UPLB College of Forestry, has embarked on the preparation of a 50-Year Forestry Development Program (1985-2034) for the Philippines. Unfortunately, it has not received any external support for this project and its own resources are simply inadequate. The Center has also proposed to undertake the formulation of long-term Regional Forestry Development Programs in cooperation with the BFD/MNR for a couple of regions. This proposed project is also intended to serve as training forum for the Regional/District and other forestry planning officers so that they can better discharge their planning functions.

OPERATIONALIZING SUSTAINED MULTIPLE-USE FOREST LAND MANAGEMENT

Brief History of Sustained Yield and Multiple Use Forest Management

28. The concepts of sustained yield and multiple use forest management are as old as forest science itself, but, for various reasons and to a large extent, they have not been successfully operationalized. Among these reasons are: a) the illusion that there exist adequate/excessive forest resources has not pushed concerned groups to develop solutions, collect data, and institute other requirements to operationalize these principles; it is only in the face of forest resources scarcity that these principles command serious interest and find their best applications although one does not have to suffer from such scarcity before implementing them; b) comprehensive solutions to the sustained multiple use forest land management problems are really quite complicated and they could require the use of computers; c) the amount of data needed to operationalize these principles is tremendous; d) various types of land production functions for single as well as multiple crops/services are also needed and such functional relationships are generally wanting; and, e) man usually needs to suffer first before he acts to solve the root causes of his sufferings. This is quite unfortunate and it can be very costly and disastrous in the case of forest land mismanagement, for, it can lead to environmental deterioration or even collapse of the whole ecosystem.

29. In the case of multiple use, much of the last 40 years have been devoted to a long-drawn debate between two groups as to which interpretation is more apt: Pearson's "there is a place and a time for every activity" and "multiple use is merely organized and coordinated specialization" or Dana and McArdle's "non-priority or

balanced-use" doctrine. When I developed and offered for the first time a course in multiple use forestry at the UPLB College of Forestry in 1975, an examination of more than 100 articles on multiple use showed that very little had been done to operationalize the concept. Since then, however, there have been more effort in the search for a solution of the sustained multiple use problem including two completed studies at UPLB. Other local efforts include the watershed development programs for Pantabangan, Magat and Mindoro.

A Management Science Approach to the Sustained Multiple Use Problem

30. The operationalization of the sustained multiple use forest land management principle requires the simultaneous solution of the land-use allocation problem and identification of the best forest land management strategy for a given forest planning unit based on a desired mix of products and services. The mix of products and services may include the whole set or a sub-set of the following: sawtimber, pulpwood, fuelwood, agroforestry crops, range crops, watershed protection, soil/water conservation, wildlife, recreation, non-timber plant products, gene bank, and various other land uses (geothermal, minerals, historical, ...).

31. The management approach that we refer to casts the sustained multiple use land management problem as an interaction of a well-defined objective function and a set of constraints. The objective function may either be in the form of a maximization of benefits or minimization of deviations from specific goal levels. The constraining functions include those for resources, production possibilities for single/multiple crops, social requirements, environmental requirements, and other constraints that may be imposed on the land-use planning unit. As it turns out, we need not get into the controversy

on which interpretation (Pearson's or Dana-McArdle's) is correct with the management approach. The final solution may take either one or a combination of both interpretations.

32. The management approach described above has three major requirements: a) quantification of the objectives, production functions and other constraints, b) cranking of the numerical solutions either by mathematical programming, simulation or heuristics, and c) putting the preliminary and final solutions on map(s) of appropriate scale(s).

33. As implied, sustained multiple-use land management planning must be done by an interdisciplinary team of forestry specialists, ecologist/environmentalist, biologist, sociologist, hydrology/watershed management specialist, range specialist, agriculturist/cropping systems specialist, operations research/systems specialist, political scientist, economists, etc. The people affected by the land-use planning unit must also be properly consulted/represented. In goal setting, particularly, equity questions like: for whom? and by who? must be considered thoroughly.

A PROPOSED FOREST LAND-USE SCENARIO

34. Table 2 provides estimates on projected demand/consumption of wood products for the years 1990, 2000 and 2025. As indicated, the big wood crisis in the future will be fuelwood not sawtimber. Our annual sawtimber consumption is expected to increase from 4.0 million cubic meters in 1980 to 6.1, 9.1 and 20.3 million cu.m. in 1990, 2000 and 2025, respectively. On the other hand, our annual fuelwood consumption is expected to increase from 26 million cu.m. in 1980 to 63, 106 and 180 million cu.m. in 1990, 2000 and 2025, respectively.

Table 2. Projected Demand for Philippine Wood Products[1/]

	1980	1990	2000	2025
Lumber (million bdft.)				
Local demand	616	890	1,273	2,374
Foreign demand	209	465	1,073	7,612
Plywood (million bdft.)				
Local demand	198	340	584	1,780
Foreign demand	290	711	1,744	16,482
Veneer (million sq.ft.)				
Foreign demand	1,518	2,277	3,184	7,345
Log requirements of above wood products (million cu.m.)				
Local demand	4.0	6.1	9.1	20.3
Foreign demand	3.5	7.3	15.7	116.9
Household fuelwood[2/] (million cu.m.)	2.9	33.2	45.8	80.2
Industrial fuelwood[3/] (million cu.m.)	3.0	30.0	60.0	100.0
Pulpwood[4/] (million cu.m.)	1.2	4.5	5.5	8.9
POPULATION (million)	47.5	59.8	73.4	118.7

1/ Based mostly on Segura, M. 1977. Demand for Philippine Timber Products in the Year 2000. PREPF Technical Reports.

2/ Assuming that 60% of all households shall use fuelwood; 50% of demand to be supplied by forest plantations.

3/ Rough estimates.

4/ Based on .025 ton/capita/year.

35. Table 3 shows the projected wood supply from the country's forest lands under a well-planned/executed forest land development management system. The remainder of the annual demand for wood, particularly fuelwood, which is to about 19.0, 48.8 and 90.2 million cu.m. in 1990, 2000 and 2025, respectively, will have to be grown on A and D and private lands. In hectares of additional fuelwood plantations, these figures translate to about 0.5, 1.2, and 2.3 million in 1990, 2000 and 2025, respectively.

36. Table 4 depicts a forest land-use scenario needed to generate the wood supply which is indicated in Table 3. The forest land-use picture is roughly summarized as follows: in 1990, there shall remain about 0.7 million hectares of commercial old-growth forests; there shall have been developed about 1.6 million hectares of agroforest lands and 1.8 million hectares of forest plantations. By the year 2000, all the commercial old-growth forests shall have been logged; there shall remain 4.9 million hectares of well-managed second-growth commercial forests; agroforestry areas shall have increased to 2.6 million hectares and forest plantations to 4.1 million hectares. By 2025, there shall be 3.5 million hectares of well-managed commercial natural forests, 1.5 million and 0.3 million hectares of protection forests and special use areas, 1.7 million hectares of developed rangelands, 2.6 million hectares of agroforest lands, and 7.1 million hectares of high-yield forest plantations, or a total of 16.7 million hectares of well-managed forest lands. In addition, 2.3 million hectares of A and D and private lands shall be devoted for forest plantation purposes.

37. The above forest land-use scenario calls for the management of some 19 million hectares for forestry and agroforestry purposes.

Table 3. Log Supply Scenario (million cu.m./year).

	1980	1990	2000	2001	2025
Old-growth Forests:					
Sawtimber	6.7	6.7	6.7	--	--
Pulpwood/Fuelwood	2.0	2.0	2.0	--	--
Commercial Second-growth Forests					
Sawtimber	nil	3.0	9.0	9.6	9.6
Pulpwood/Fuelwood	nil	2.5	7.5	8.0	8.0
Plantations					
Sawtimber	nil	3.7	8.0	8.5	10.7
Pulpwood/Fuelwood	1.0	43.7	55.0	56.1	90.9

Table 4. A Forest Land-use Scenario to Meet Projected Wood Requirements (in million hectares).

	1980	1990	2000	2025
Commercial old-growth forests	1.4	0.7	--	--
Adequately stocked second growth	2.0	3.2	4.0	3.5
Inadequately-stock second growth	1.7	1.0	--	--
Reproduction-brush	3.7	3.0	1.7	--
Non-commercial/Protection/ Reservations	1.8	1.8	1.5	1.5
Special-use Areas	0.2	0.3	0.3	0.3
Rangelands/Grasslands	1.0	1.5	1.7	1.7
Agroforest lands	0.6	1.6	2.6	2.6
Unproductive grass/brush lands	4.1	1.8	0.8	--
Sawtimber plantations	0.1	0.3	0.6	1.2
Pulpwood/Fuelwood plantations	0.1	1.5	3.5	5.9
T O T A L	16.7	16.7	16.7	16.7

This implies about 8 million hectares for pure agricultural production and some 3 million hectares for industrial and urban purposes. The expectation relative to food production is for the development and implementation of more intensive and high yield technologies and strategies. Also, industry will have to contribute more to providing the people's basic needs. The uplands and other fragile ecosystems shall then be devoted to forestry and related uses to keep the agricultural lands highly productive on a sustained basis.

THE PEOPLE'S FORESTS PROGRAM

A Turn-Around from Exploitative Dependence of People on the Forest to Community Forestry

38. Philippine forestry is distinct from that of developed countries not only in terms of the forest formations but more so for the presence of people in and around the forests who depend on these forests for their livelihood. This dependence is basically exploitative and destructive, hence, it can be said that Philippine forestry is quite inadequate in constructive activities by the people. Other than the Tree Planting Decree and the Arbor Day celebration which are never effectively implemented, there has been no direct constructive forestry program which the average Filipino can take pride in. This glaring inadequacy of Philippine forestry calls for a system which directly benefits the people for constructive forestry activities and immediately disbenefits them for any destructive event in the forest. Such a system is one of the major recommendations of the proposed "Integrated Forestry System of the Philippines" which was developed by the Forestry Development Center, UPLB-CF, in 1981.

39. More specifically, the mission and obligations of the Forestry Communities are stated in that document as follows: "The

forestry communities shall support forestry programs and undertake socially and economically viable forestry development projects. Toward this end, the forestry communities shall: a) engage in community forestry projects such as the establishment of shelterbelts, forest parks, community forests, community beautification projects, and other forestry-related endeavors when the public interest so demands; b) participate in planning, monitoring, and evaluation of government or private forestry projects affecting the community; c) utilize whenever possible community resources in terms of organization, labor, and indigenous materials and technologies in forestry-related activities in the spirit of self-reliance; ..." The People's Forests Program may, therefore, be viewed as a response to this call for the people's active participation in viable forest development projects. The major impacts of such a program are of two types: it brings forestry closer to the people and would have tremendous conservation implications and it puts back idle/unproductive/degraded and otherwise destructive land areas into production.

General Strategy

40. The most problematic question in any forest development project including community forestry or the People's Forests Program has to do with economic and financial viability. The high cost of forest development and the long-term nature of forest production render most forest development projects uneconomical/unprofitable. A general strategy to solve this problem is the integration of early revenue-generating components into the forestry/agroforestry cropping system. Consider a high value timber crop like narra or mahogany. Based on the timber crop alone, the economic internal rate of return (EIRR) is only 10 to 15 percent. But, if one crop of rice or corn on the

first year and a leafmeal production component are included, the EIRR could be more than 30%.

Implications on Land Use and Forest Development

41. Based on projected needs, some 3.8 million hectares of degraded forest lands need to be developed by 1990: 2.1 for fuelwood/pulpwood production, 1.0 for agroforestry, 0.5 for range management, and 0.2 for sawtimber production. In addition, some 0.5 million hectares of A and D/private lands shall need to be developed primarily for fuelwood production purposes. Such a massive forest development program would require a total budget of about ₱34 billion (up to 1990) if everything other than land is costed.

42. In terms of the People's Forests (Community Forestry) Program, the most likely areas of participation shall be in fuelwood production and agroforestry. This means community forestry on 1.0 million hectares of agroforest lands and on a portion of the 2.6 million hectares of fuelwood/pulpwood production areas by 1990. Industrial forestry companies are also expected to participate in the fuelwood production program.

43. It is anticipated that leafmeal shall be a significant crop in the agroforest lands combined with high value fruit trees, cattle fattening (in cooperation with neighboring forest range/pasture areas), and other early revenue-generating components. Leafmeal/green manure shall also be a principal product in the fuelwood plantations both as by-product and a separate crop in the integrated cropping systems.

CONCLUDING REMARKS

44. The Community Forestry (People's Forests) Program if properly planned and seriously implemented can be a major breakthrough in

Philippine forestry. On the other hand, considering the critical stage we have reached in forest/environmental degradation, it could also seal the doom not only of Philippine forestry but of a viable national ecosystem.

45. The program calls for more comprehensive planning and determination of more realistic goals. In the short-run, leafmeal production shall be a most profitable agroforestry and forestry venture but the leafmeal market can be easily saturated. Moreover, marginal agricultural lands are likely to be more productive than the degraded forest lands such that in the long run, leafmeal production in the less accessible and less productive forest lands shall be eased out eventually by more accessible and more productive areas. Furthermore, our projections indicate that the real wood crisis shall be fuelwood, and community forestry can profitably respond to such a crisis.

46. The information presently available relative to the People's Forests Program indicates projected incomes from one hectare of ipil-ipil leafmeal farm of ₱25,000 to ₱50,000 per year. Based on a 10-ton leafmeal yield per hectare per year and a farm gate price of ₱1,500 per ton, one can only expect an annual gross income of ₱15,000. A leafmeal farmer would have to fatten 5 calves per year or undertake other projects in addition to his leafmeal farm, to make a gross income of ₱25,000 per year.

47. The specific cases and issues presented above are, of course, an oversimplication of the Community Forestry Program which brings us back to the basic need to plan more comprehensively and implement these plans seriously. We must also guard against these projects being taken advantage of by all kinds of unscrupulous members of society.

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Figure 1. Proposed Land Assessment and Allocation (LAA) System.